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ABSTRACT

The decision to develop an estimated income scale arose from a wish to prove or disprove the statement that colleges like Brown University may be headed toward a situation where the student body will consist of the rich and the poor, the traditional group of middle class having been eliminated. As the research proceeded, it became evident that an instrument could be created with potential far beyond the original intention, providing a valuable dimension for a planning office making projections of future needs and the resources to meet those needs. Further, such a scale would have immediate value for officials concerned with admission, financial aid, fund raising and alumni relations. This document presents a model of the scale described above and discusses in detail the possible uses of such a scale. (Author/HS)

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AN ESTIMATED INCOME SCALE

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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June, 1971

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Reasons for Development

The decision of this office to develop an estimated income scale arose from a wish to prove or disprove the statement that colleges like Brown may be headed toward a situation where the student body will consist of rich and poor, the traditional group of "middle class" having been eliminated. As the research proceeded, it became clear that an instrument could be created with potential far beyond the original intention, providing a valuable dimension for a planning office making projections of future needs and the resources to meet those needs. Further, such a scale would have immediate value for officials concerned with admission, financial aid, fund raising and alumni relations.

Need for Such a Scale

It has not been the policy of Brown to request family income information from admission applicants, although it has always been available for the 40% of the applicant group who apply for financial aid. Although we could describe any candidate pool in terms of abilities, achievements and other important items, for 60% of the applicants we could not get at their vital description in terms of the ability to pay the sizeable amount of money that a college education entails today. On the premise that Brown may wish to continue a policy of not asking for such data, but that

diminishing resources make this information increasingly more necessary, an indirect means of assessment would be a sensible substitute.

Potential Uses of Such Data

1. Income distributions of total applicant groups, matriculated classes, those who withdraw before and also after decision, could give new direction to the admission process. Income as it is related to geographical representation of candidates could be examined as well as trends within subgroups. If examination of socio-economic differences is important, visualization of such differences in 8000 applications between groups, and trends from year to year, cannot rise above hunch level without objective data. The ability quickly to enter the candidate pool, for example at the waiting list point to choose specific groups determined by ability to pay, would be enhanced by having at least nominal data on record. Decisions with regard to class expansion could be better examined in financial terms.

2. If in view of the financial situation of the University, it ever becomes necessary to pay as much attention to upper income as is now paid to lower income, then such a scale or a better one will be a necessity. An important examination, for example, might be determination of the extent to which current admission procedures result in acceptance of those of the candidate pool who have the ability to pay.

3. The scale is designed not only to indicate amounts of money but also to identify parental occupation and status. It is possible, therefore, to capture specific occupations. We can look at the entire spectrum of occupations - from sons and daughters of executives, to so-called "blue-collar middle class" and those with no income to report. Also the normalized nature of the scale makes for comparisons over at least a few years without having to be too concerned about inflation. Revisions will be necessary as rank order changes, for example the rising wages of blue-collar workers and the continued professionalization of women.

4. Making use of an estimated parental income scale would lead to a better understanding of the economic consequences for the University of changes of policy with respect to sizes of departments, degree offerings, concentrations and so forth. It may be, for example, that increasing the number of students in a given academic area would lead to a disproportionate increase in the need for financial aid. This scale would provide hard data to test such a hypothesis. Another example may be an examination of the economic consequences of shifting the proportions of men and women in the undergraduate student body. Still another use of the scale would be to get closer to the real costs of departments, considered in terms of the people who choose them.

5. New insights into the problem of student fees may be possible, the potential for raising them on the one hand and the consequences for increased financial aid on the other. If these tend to cancel each other, then the hypothesis may be that raising fees is potentially disastrous. Another would be that raising fees not only restricts the candidate pool, it also changes the nature of the student body.

6. Already the Development Office has called for listings of the Class of 1974, both Brown and Pembroke, listings by family income interval and parental occupations. Such listings make possible the identification of potential alumni givers, and the early involvement of them in alumni affairs. The Development Office will now have a means of assessing the parental affluence of all members of the class. It will also have a ready means of zeroing in upon specific groups for their closer examination (the scale does not attempt to estimate sophisticated incomes, but it does categorize, and the Development Office can go on from that point).

7. Clearly, such a scale is a socio-economic index. It has high correlation, for example, with the environmental index that the author created for the Ford Study. Not only may such a scale help better to describe the nature of the student body but also it may provide insights in the examination of dropouts, transferees between departments and other studies of attrition, aspiration and achievement.

8. The scale is derived from parental income but it also becomes immediately an estimate of alumni earnings with obvious application. Since it is predicted upon an age group of about 40-50 years for the typical parents of students, it would need to be scaled both down and up, but the possibility exists for doing this with the cooperation of the Development Office.

APPENDIX IA

DISTRIBUTION OF ACTUALLY REPORTED AND ESTIMATED INCOME FOR MEN AND WOMEN OF THE CLASS OF 1974 WHO SOUGHT FINANCIAL AID

Income Interval	% Men		% Women		% Men & Women	
	Actual Income	Estimated Income	Actual Income	Estimated Income	Actual Income	Estimated Income
Less than 4000	3.6	4.5	6.5	7.2	4.6	5.4
4000 - 5999	2.6	2.6	3.3	3.3	2.8	2.8
6000 - 7999	3.2	3.2	8.5	7.8	5.0	4.8
8000 - 9999	8.8	4.2	5.2	5.2	7.6	4.6
10000 - 12499	14.3	12.7	7.8	11.1	12.1	12.1
12500 - 14999	12.7	15.9	10.4	9.8	11.9	13.9
15000 - 19999	27.0	29.2	25.5	22.9	26.5	27.1
20000 - 24999	13.6	14.3	19.0	16.3	15.4	15.0
25000 - 29999	7.1	9.4	4.6	10.4	6.3	9.8
30000 - 34999	4.5	1.3	7.2	2.6	5.4	1.7
35000 - 39999	1.9	1.6	0.7	2.0	1.5	1.7
40000 or more	0.6	1.0	1.3	1.3	0.9	1.1
N	308	308	153	153	461	461
Mean	16624	16934	16856	16589	16726	16819
S.D.	7166	7682	7849	8651	7391	8032

NOTES: Parents Confidential Statement data were increased 12% for inflation

Correlation between actual and estimated income for the largest sample (n = 461) = .77 with a non-significant difference between means.

APPENDIX IB

DISTRIBUTIONS OF THE SCALE FOR THE SUBSETS OF MEN AND WOMEN WHO OF THE CLASS OF 1974 SOUGHT FINANCIAL AID AND THOSE WHO DID NOT INDICATE NEED

Income Interval	% Men			% Women			% Men & Women		
	With PCS	No PCS	To-tal	With PCS	No PCS	To-tal	With PCS	No PCs	To-tal
Less than 4000	4.5	0.6	2.2	7.2	0.0	3.4	5.4	0.5	2.5
4000 - 5999	2.6	0.2	1.2	3.3	0.0	1.5	2.8	0.2	1.3
6000 - 7999	3.2	0.9	1.8	7.8	0.6	4.0	4.8	0.8	2.4
8000 - 9999	4.2	0.4	1.9	5.2	0.6	2.8	4.6	0.5	2.2
10000 - 12499	12.7	3.8	7.3	11.1	2.3	6.5	12.1	3.4	7.1
12500 - 14999	15.9	6.2	10.1	9.8	5.8	7.7	13.9	6.1	9.4
15000 - 19999	29.2	16.5	21.5	22.9	16.8	19.7	27.1	16.6	21.0
20000 - 24999	14.3	19.9	17.7	16.3	19.8	18.2	15.0	19.8	17.8
25000 - 29999	9.4	16.9	13.9	10.4	19.2	15.1	9.8	17.5	14.3
30000 - 34999	1.3	10.5	6.8	2.6	10.5	6.8	1.7	10.5	6.8
35000 - 39999	1.6	8.5	5.8	2.0	9.3	5.8	1.7	8.8	5.8
40000 or more	1.0	15.6	9.8	1.3	15.1	8.6	1.1	15.5	9.4
N	308	468	776	153	172	325	461	640	1101
Mean	16934	27824	23501	16589	28507	22897	16819	28006	23323
S.D.	7682	12341	11991	8651	11565	11875	8032	12134	11960

NOTE: These are the distributions for all members -- scale only.

APPENDIX IC

DISTRIBUTIONS FOR MEN AND WOMEN OF THE CLASS OF 1974
COMBINING REAL INCOME FOR THOSE WHO INDICATED
FINANCIAL NEED WITH ESTIMATED INCOME FOR THOSE WHO DID NOT

Income Interval	% Men	% Women	% Men & Women
Less than 4000	1.8	3.1	2.2
4000 - 5999	1.2	1.5	1.3
6000 - 7999	1.8	4.3	2.5
8000 - 9999	3.7	3.8	3.4
10000 - 12499	8.0	4.9	7.1
12500 - 14999	8.8	8.0	8.5
15000 - 19999	20.6	20.9	20.7
20000 - 24999	17.4	19.4	18.0
25000 - 29999	13.0	12.3	12.8
30000 - 34999	8.2	8.9	8.4
35000 - 39999	5.9	5.2	5.7
40000 or more	9.7	8.6	9.4
N	776	325	1101

NOTE: For studies of income only, it is recommended that combined data be used. Why use an estimate, when real data is available for a subset? The scale serves its purpose by estimating for the remaining sixty per cent.

However, it is recommended that all candidates for admission should have the scaled estimates too, for the valuable property of categorization of all students.

APPENDIX ID

DISTRIBUTIONS OF SELF-ESTIMATED INCOME, CLASS OF 1974, FOR PRIVATE UNIVERSITIES AND FOR PRINCETON UNIVERSITY

Income Interval	Private Universities			Princeton University		
	Men	Women	Total	Men	Women	Total
Less than 4000	2.6	2.9	2.7	2.6	0.6	2.2
4000 - 5999	3.8	4.6	4.1	2.9	3.2	2.9
6000 - 7999	6.7	7.1	6.9	4.0	5.8	4.3
8000 - 9999	10.2	9.4	9.9	4.7	6.5	5.0
10000 - 12499	15.9	13.6	15.0	9.6	3.2	8.5
12500 - 14999	14.4	12.6	13.7	10.0	9.7	10.0
15000 - 19999	15.8	14.7	15.4	16.8	9.7	15.5
20000 - 24999	10.3	11.4	10.7	13.6	19.4	14.7
25000 - 29999	5.5	6.4	5.9	8.0	8.4	8.1
30000 - 34999	3.7	5.4	4.4	5.3	7.7	5.8
35000 - 39999	2.4	3.3	2.8	3.2	4.5	3.4
40000 or more	8.7	8.4	8.6	19.2	21.3	19.6

NOTE: These norms were taken from National Norms for Entering College Freshmen - Fall 1970, American Council on Education, and Princeton Alumni Weekly, February 23, 1971.

Private Universities (non-sectarian) include all of the Ivy League except Brown and Yale.

APPENDIX II

A Brief History

Published information was found generally to be based upon the 1960 Census or earlier ones. For us, such information was obsolete. Indeed, even PCS data currently reported is old. It is reasonable to assume that forms submitted for Academic Year 1971, prior to September 1970, reflect tax returns of the first quarter which are returns for 1969. The situation is compounded when inflation is taken into account.

A survey of literature revealed little work done in the prediction of income. Our earliest intention, in fact, was to use the multiple regression analysis model using socio-economic predictors along with a crude scale such as could be derived from census data. This was abandoned because of the insufficiency of the criterion, and the technique became that of getting the best possible scale.

Attempts to make use of 1970 Census data were premature, but Genesee Computer Center of Rochester indicated the possibility of deriving distributions of jobs and status according to our parameters by entering 1970 data for geographical area--Rhode Island, New England, USA, according to the amount we are prepared to pay (in about one year). A minimum fee would be $5,000. So we turned to local possibilities.

A first attempt used a cross-section of the four current undergraduate classes who submitted family income data to other Sociology students in a class project. The data were found not to be reliable, with possible halo effects and deliberate distortions. It also may be that students do not know their parents' income very precisely, especially when it is high. This comment in no way criticizes Sociology's purpose, which, in fact, is the learning of sampling techniques.

Conferences with members of the Sociology Department led to deriving estimated income scales from the most recent Consumer Income Reports of the U. S. Department of Commerece, using medians of heads of families. The derived scales were too limited and estimates too low for Brown University parents, in part due to the lag between collection and publication of data. At the time of the study, the most recent were 1968.

The most desirable norms would fit parents about 40-50 years of age appropriate to the parents of undergraduates. The Civil Service Scales are calibrated by level and years of service. With the help of Mr. Perella, manager of the Providence Civil Service Commission office, matchings of positions and level were made with estimates of income for those in federal service in the same position. The derived scale was also limited, with no scale for several categories, and an absence of data at the executive level.

A survey was also made of professional associations and workers' unions at all levels. The response was better than expected but not excellent. The most valuable results were the

raising of annual incomes for workers and the lowering of incomes for self-employed professionals.

In the final analysis, a little from every approach was incorporated in a scale and then cross-validated against the real reported income of the Class of 1974 who submitted the PCS (about 40%). Since the members of this sample poorly represent high income levels, some caution in the interpretation of this analysis is suggested; it is reasonable to assume that a higher correlation between real and estimated income (.77) would be expected in a more representative sample of the total class or pool.

APPENDIX III

Interpretation of the Scale

A scale of point data was derived indicating typical income of occupational groups by level and sometimes sex, for executive, professional, managerial, clerical and worker occupations, stratified according to the supervisory, journeyman or self-employed nature of the work, and for executives the size of the firm.

Each number serves two purposes. It categorizes the occupation and the level for retrieval of this information. It also indicates an income assignment. For the Class of 1974, each may be multiplied by 162, and each has a standard deviation. A simple program may be written to distribute incomes as if it were a real-life situation. Some of these S.D.'s repeat, since it was necessary to combine the very small categories, but in time, with pile-ups over three years for example, each may be treated individually.

It should also be noted that the numbers are rank ordered. The method of determining means for categories, and then normalizing by dividing all by the least, made not only for relative and additive numbers but also for a code. It is reasonable to assume that although amounts of income may change from year to year, rankings will not vary appreciably within a few years. Conversion to amounts therefore will take into account inflation et cetera, but the scale does not have to be recreated every year.

Example

309 Recognizing from an applicant's admission form that his father is a top echelon executive in a large known firm--assign 309

121 If mother is a college professor, but not a head of department or dean, assign 121 to her

Printed out would be 309 121 430 where 430 is the sum and represents family income, in this case

430 X 162 = $69,660

309 and 121 have standard deviations of 23 and 18 respectively--see Appendix V.

For distribution purposes, 50% of the number in category 309 would be assigned 309, 25% assigned 286 and 25% assigned 332. Similarly, 50% of category 121 would be assigned 121, 25% assigned 103 and 25% assigned 139. Done individually, modified family incomes will be the output for distribution. After all frequency distributions have been made and consolidated, for interval purposes, conversion of the scale to amounts of money can be made.

In the scale itself, unless a specific number has been assigned to women, assign the men's amount to women. An example would be women teachers who typically make a delayed return to their profession. She is assigned 50. A single teacher, however, should be assigned 84 like a man, but she is not likely to be a parent unless she is widowed. In that case she is assigned 84 not 50.